the bird's throat. The Snake-Bird, or Darter (*Plotus novæ-hollandiæ*), "Gercarthin," when alarmed, sinks its body below the surface of the water, and gets quietly away, with only the top of its head and the long, sharp-pointed bill showing. It was never abundant about Boga. The Little Crake (*Porzana palustris*), "Tillip," and the Pectoral Rail (*Hypotænidia philippensis*), "Lerrup," are both shy birds. Their nests are found occasionally, the maximum number of eggs in a clutch being six and ten respectively. The Sharp-tailed Stint (*Pisobia acuminata*) is often a common bird, and in favourable seasons every sand-spit round some of the lakes is covered with them.

In 1904 I found the Red-backed Parrot (*Psephotus hæmatonotus*), "Gechurt," nesting freely in the hollow gum-trees in the Yassam swamp, the maximum number of eggs in a clutch being four. Many of the hollow branches not occupied by the Parrot were tenanted by the Tree-Martin (*Petrochelidon nigricans*). In 1892 the banks on either side of the creek which fills Lake Boga from the Murray were lined with willow-trees, which had been planted by the Moravian missionaries, the original cuttings coming from a willow growing over Napoleon's grave at St. Helena. These trees, with their green curtain of branchlets sweeping the face of the creek, made a charming picture. These lower branches were chosen by hundreds of Reed-Warblers (*Acrocephalus australis*), "Garcoon Garcoon," for nesting. The reeds at the edge of the creek were also filled with nests. In some seasons the Black-tailed Native-Hens (*Tribonyx ventralis*), "Dallip," come in thousands, and, after nesting, depart as speedily as they come. I once found a nest of the Grass-Bird (*Megalurus gramineus*) in a polygonum bush which was surrounded by water. Two or three feathers of the Black-tailed Native-Hen were built into the nests, shafts down, the feathery portion completely doming the nest. The Harrier, or Swamp-Hawk (*Circus gouldi*), "Birr," is a common bird. It places its nest in long grass, in growing crop, or in rushes in the middle of a swamp.

Bird-Life on White Island (N.Z.)

BY W. R. B. OLIVER, R.A.O.U., AUCKLAND.

THERE is scarcely a spot more delightful for the naturalist than a remote island, where sea-birds resort each year for the purpose of rearing their young, and where the balance of nature has not been disturbed by the intrusion of man. Such places are becoming fewer every year; but, thanks to their inaccessibility, rough and rocky surface, and often inhospitable climate, many islands still exist in their primeval condition in the southern seas. Included in the New Zealand biological region are some of the most interesting of the nurseries for sea-birds.

Though not a rendezvous for many of the ocean Petrels, White Island is, nevertheless, of interest to the ornithologist as the breeding-place for sea-birds under conditions—namely, in the presence of poisonous fumes—scarcely paralleled elsewhere. I considered myself fortunate, therefore, when, through the courtesy of Mr. J. G. Magee, manager of the White Island Sulphur Co., I was permitted to visit White Island during December, 1912. Leaving Opotiki in the company's launch at 3 a.m. on the 6th, a course nearly due north was steered for the island, which, though 35 miles out in the Bay of Plenty, was clearly visible, and easily attracted attention by the white steam cloud resting over it. Viewed from the sea at close quarters, it was a magnificent sight. The sun, rising from near the south-east, made the island stand out like a jewel against the clear blue sky and deeper blue of the calm waters. The island itself is of a light pink colour, clothed at its base and western end with dark green vegetation. Where the crater wall is broken away (as it is at the eastern end, where we landed), the sulphur-coloured cliffs of the interior are visible, and over all rests a huge cloud of steam, from which the island receives its name. We landed at 7.40 a.m. in Crater Bay, near where the overflow from the crater lake discharges. The sea water here is discoloured, and no life is found for some distance on either side.

White Island is only 1½ miles in length, but it rises to a height of 1,075 feet above sea-level. It is a volcanic cone, with a central crater, which has steep outer and precipitous inner faces, but is broken away almost to sea-level at the eastern end, where a landing may be effected in fine weather. Within the crater is a large lake of greenish-yellow water, boiling in several places, and containing, among other chemicals, over 5 per cent. of free hydrochloric acid. The outer slopes of the crater are very steep, difficult and dangerous to walk over, as the stones give way at every step, and deeply furrowed by innumerable channels, often impassable on account of their precipitous sides of loose, detachable material. An immense quantity of steam is discharged from the crater at all times. Issuing from three large and innumerable small blow-holes near the level of the lake, it usually ascends to the top of the island, where it is caught by the wind and carried away. Apparently all steam issuing from the White Island crater is charged with poisonous fumes, that from the lake being particularly noxious. It has a choking effect, and even in mild doses, such as one can scarcely avoid when exploring the crater, causes constant coughing, and colours the saliva pink. It is the presence in the atmosphere of poisonous fumes which inhibits (except at places remote from the crater) the growth of vegetation on the island. It also occasionally disturbs the sea-birds, but, apparently, does not interfere with the rearing of their young.

I spent three days on White Island, during the whole of which time the weather was fine. Fearing a change, however, I decided to return to Opotiki in a launch owned by a Maori, who came over for the day to collect young Mutton-Birds for eating. Trusting to a compass which was evidently affected by a lamp and the engine, we first sighted the New Zealand coast 11 miles to the east of Opotiki. At 1 a.m. the Opotiki bar was reached, but, it being low tide, could not be crossed until 3.30 a.m.—eight hours after leaving the island.

Five species of birds are known to breed on White Island. One of these I was unable to identify, only mutilated specimens being seen. It was a small Storm-Petrel, which probably suffers from the depredations of rats (*Mus exulans*), of which species I saw one dead specimen.

Sula australis (Australian Gannet).

There are about six colonies of Gannets on the south coast of White Island, and one on a rock a little distance from the shore. The areas occupied are clear of vegetation—indeed, the presence of dead pohutukawa plants (*Metrosideros tomentosa*) in the midst of some of the colonies shows that the birds not only prevent the scrub from spreading, but actually kill any on ground which they may occupy.

It is not practicable to visit the Gannet colonies by land, as it means climbing a dangerous track on the inner cliff-face of the crater, and then descending the steep slope to the sea. I did not attempt this route, but made use of the Sulphur Company's boat, which is kept for the purpose of getting firewood. The first colony visited (7th December) contained mostly fresh eggs, though in many incubation had begun, and some young birds were noticed. Most of the chicks had just hatched, though a very few were large and covered with white down. The nests were placed at almost equal distances apart, each consisting of a low mound of earth with a hollow at the top, in most cases lined with *Chenopodium* stalks. I do not believe that the birds do more towards making the nest than perhaps scratching a little hollow and placing some pieces of *Chenopodium* or seaweed therein, the weather and the protective action of guano accomplishing the rest. The mound, therefore, is simply caused by rain water washing away the ground round the nest.

Only one egg is laid. At first it is of a light greenish colour, and covered with a thick layer of lime. Soon, however, it becomes dirty, and the time during which it has been brooded can be judged roughly by its colour. When first hatched the young Gannet is naked and entirely black. As it grows it becomes covered with pure white down, and is then really a pretty object. Now, before rising the adult Gannet almost invariably disgorges the contents of its stomach, and the young instinctively performs the same act, though it is incapable of flight. Even naked birds just hatched endeavour, when approached, to throw up their food. Here seems to be a case of instinct at fault, for, though it may be necessary for the adult to relieve itself of its load of fish in order to rise quickly, it is incredible that it is of any benefit to the young to lose a meal.

I examined the contents of the stomachs of several birds, and found them to consist mostly of small garfish. In some, however, there were other kinds of fishes and squids. Though Gannets are usually silent, when their breeding colony is approached they frequently rise in a body, uttering cries all the time. The whole colony rises in a similar way when the wind carries the poisonous fumes from the crater among the sitting birds. The fact that the prevailing winds in the Bay of Plenty are from the west and south-west, thus carrying the fumes in a north-easterly direction, no doubt explains why the bulk of the vegetation and all the Gannet colonies on White Island are on the west and south coasts.

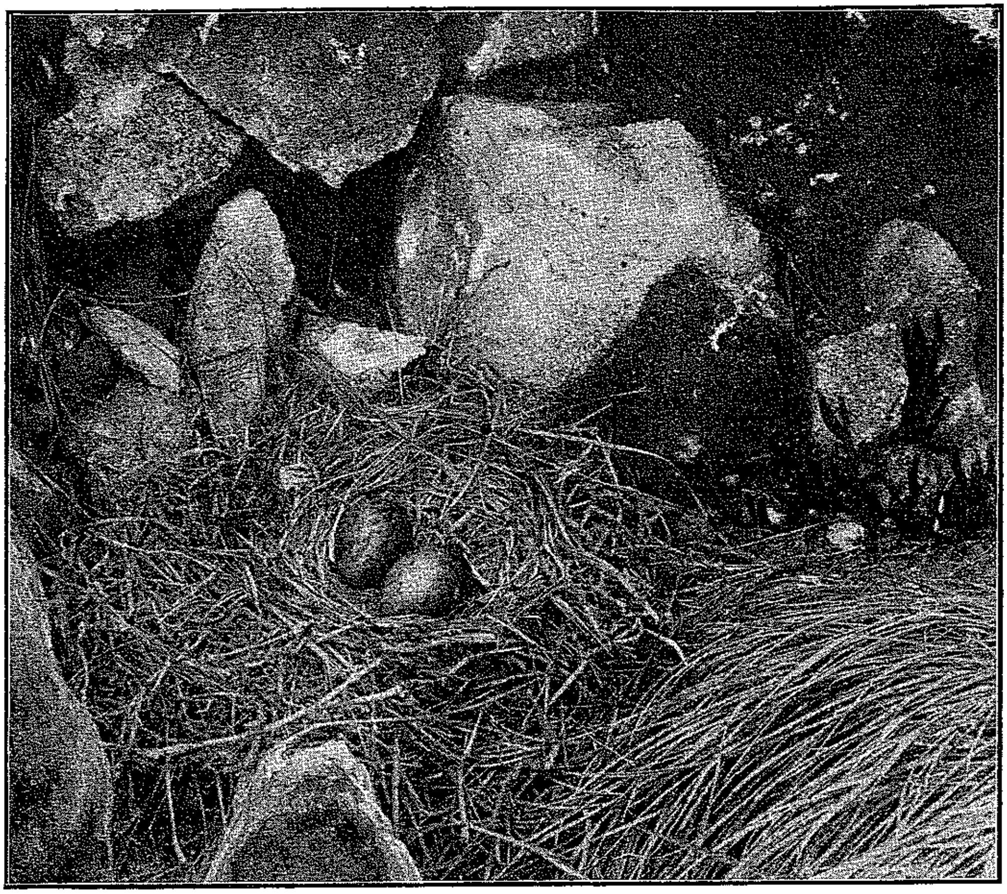
Another and larger colony of Gannets which I visited (8th December) contained mostly young birds just hatched, though there were fresh eggs and large chicks covered with white down. The breeding season, therefore, extends over many months, but most of the eggs are laid about the beginning of November. Seaweed was noticed as lining to a large number of nests in this colony. Unlike the birds visited on the previous day, these Gannets did not take much notice of me, and I was enabled to take photographs at close quarters. Indeed, if not careful, one might receive painful wounds from their large, pointed bills.

Larus scopulinus (Red-billed Gull).

The common Mackerel Gull of New Zealand breeds on the east point and north coast of White Island. On the east point their nests are placed among rocks and slopes covered with tussock-grass (*Poa anceps*). The nest is small, being composed merely of a few stalks of *Mesembryanthemum*, and perhaps lined with grass. Several nests, each containing two eggs, apparently freshly laid, were seen. On the north coast a small colony breeds on a rocky point. Here were seen nests with eggs, young birds just hatched, and others almost fully fledged. The newly-hatched birds were covered with down of a creamy-white colour, with black spots. At my approach most of the young endeavoured to hide in rock crevices, and one took to the water, swimming out some distance.

Œstrelata macroptera (Great-winged Petrel).

This is the "Mutton-Bird" of the Auckland district, the term being loosely applied to any of the Petrels or Shearwaters which are used for food. White Island, being 35 miles from the mainland, is seldom visited for its birds; but while I was there a number was collected by some Maoris, who had come over from Opotiki for the day. The burrows are found in all the patches of vegetation round the coast of the island. As is usual in such colonies, the ground is practically undermined, and one's foot may sink suddenly at any step. The single egg is probably laid in August. At the time of my visit each burrow contained a nearly fully-fledged young bird, which fought vigorously on being brought to the surface.



Nest of Red-billed Gull (*Larus scopulinus*).

FROM A PHOTO. BY W. R. B. OLIVER.

Sterna frontalis (White-fronted Tern).

There is a small breeding colony of this species at the eastern point of White Island. I was not able to examine the nests, which were high up on a cliff facing the sea.

Visit to Torilla Plains.

BY E. D. BARNARD, R.A.O.U., KOONIGAL (Q.)

AN invitation from the manager of Torilla Plains Station to spend a few days with him observing waterfowl during the breeding season was hailed with delight. I left home 4th March. A ride for a day and a half brought me to Wowan, the present terminus of the newly-opened Dawson Valley railway. Wowan is said to be one of the native names of the Brush-Turkey (*Catheturus lathami*). A train ride of about two hours brought me to Mount Morgan, the celebrated mining town, which is scattered over a large area of rough and rocky ridges at the source of the Dee River. Here we changed trains, and, after descending the famous Razorback